

CLAIMS

I/We claim:

- [c1] 1. A method of wire-bonding, comprising:
 positioning a first electrode and a second electrode at least proximate to a
 wire attached to a terminal of a microelectronic component; and
 severing the wire with an electrical discharge between the first and second
 electrodes.
- [c2] 2. The method of claim 1 wherein severing the wire with the electrical
 discharge comprises forming a first segment of wire having a first end attached to
 the terminal and a second, free end with a ball.
- [c3] 3. The method of claim 1, further comprising attaching the wire to the
 terminal by moving a capillary of a bond head to a position at least proximate to
 the terminal, and wherein positioning the first and second electrodes comprises
 moving the first and second electrodes relative to the bond head.
- [c4] 4. The method of claim 1, further comprising attaching the wire to the
 terminal by moving a capillary of a bond head to a position at least proximate to
 the terminal, and wherein positioning the first and second electrodes comprises
 moving the first and second electrodes and the bond head as a unit.
- [c5] 5. The method of claim 1 wherein:
 the first electrode comprises a first tip and the second electrode comprises
 a second tip; and
 positioning the first and second electrodes comprises positioning the first
 and second tips on opposite sides of the wire.

- [c6] 6. The method of claim 1 wherein:
the first electrode comprises a first end portion and the second electrode
comprises a second end portion; and
positioning the first and second electrodes comprises positioning the first
and second end portions at an angle generally normal to the wire.
- [c7] 7. The method of claim 1, further comprising grounding the wire before
severing the wire.
- [c8] 8. The method of claim 1 wherein:
the first electrode comprises an anode and the second electrode comprises
a cathode; and
positioning the first and second electrodes comprises positioning the
anode and the cathode at least proximate to the wire.
- [c9] 9. The method of claim 1 wherein:
the first and second electrodes form at least part of a wire severing tool;
and
positioning the first and second electrodes comprises positioning the wire
in an opening of the wire severing tool between the first and second
electrodes.
- [c10] 10. A method of wire-bonding, comprising:
attaching a wire to a terminal of a microelectronic component; and
generating an arc between a first electrode and a second electrode to
sever the wire at a point at least proximate to the first and second
electrodes, wherein the first and second electrodes are moveable
with respect to the wire.

- [c11] 11. The method of claim 10 wherein generating the arc between the first and second electrodes comprises forming a first segment of wire having a first end attached to the terminal and a second, free end with a ball.
- [c12] 12. The method of claim 10, further comprising moving the first and second electrodes relative to a bond head to position the first and second electrodes at least proximate to the wire before generating the arc.
- [c13] 13. The method of claim 10, further comprising moving the first and second electrodes and a bond head as a unit to position the first and second electrodes at least proximate to the wire before generating the arc.
- [c14] 14. The method of claim 10 wherein:
the first electrode comprises a first tip and the second electrode comprises a second tip; and
the method further comprises positioning the first and second tips on opposite sides of the wire before generating the arc.
- [c15] 15. The method of claim 10 wherein:
the first electrode comprises a first end portion and the second electrode comprises a second end portion; and
the method further comprises positioning the first and second end portions at an angle generally normal to the wire before generating the arc.
- [c16] 16. The method of claim 10 wherein:
the first electrode comprises an anode and the second electrode comprises a cathode; and
generating the arc comprises generating the arc between the anode and the cathode.

- [c17] 17. The method of claim 10 wherein:
the first and second electrodes form at least part of a wire severing tool;
and
the method further comprises positioning the wire in an opening of the wire severing tool between the first and second electrodes before generating the arc.
- [c18] 18. A method of wire-bonding, comprising:
providing a wire severing tool having a first electrode and a second electrode spaced apart from at least a portion of the first electrode to define an opening;
positioning a wire in the opening between the first and second electrodes;
and
generating an electrical discharge between the first and second electrodes to sever the wire.
- [c19] 19. The method of claim 18, further comprising bonding the wire to a terminal of a microelectronic component with a wire bonder.
- [c20] 20. The method of claim 18 wherein positioning the wire comprises moving the wire severing tool relative to a bond head.
- [c21] 21. The method of claim 18 wherein positioning the wire comprises moving the wire severing tool and a bond head as a unit.
- [c22] 22. The method of claim 18 wherein:
the first electrode of the wire severing tool comprises a first tip and the second electrode comprises a second tip; and
positioning the wire comprises moving the wire severing tool to position the first and second tips on opposite sides of the wire.

- [c23] 23. The method of claim 18 wherein:
the first electrode of the wire severing tool comprises a first end portion and
the second electrode comprises a second end portion; and
positioning the wire comprises moving the wire severing tool to position the
first and second end portions at an angle generally normal to the
wire.
- [c24] 24. A wire bonder for bonding a wire to a terminal of a microelectronic
component, the wire bonder comprising:
a bond head having a capillary;
a first electrode and a second electrode each coupled to the bond head;
and
a controller operably coupled to the first and second electrodes to
selectively generate an electrical discharge between the first and
second electrodes to sever the wire.
- [c25] 25. The wire bonder of claim 24 wherein the first and second electrodes
are attached to a dielectric member.
- [c26] 26. The wire bonder of claim 24 wherein the first and second electrodes
are attached to a dielectric member, and wherein the first electrode has a first
arcuate portion with a first tip and the second electrode has a second arcuate
portion with a second tip spaced apart from the first tip by a gap sized to receive
the wire.
- [c27] 27. The wire bonder of claim 24 wherein the first and second electrodes
and the bond head are movable as a unit.

[c28] 28. The wire bonder of claim 24, further comprising a positioning mechanism coupled to the first and second electrodes to move the first and second electrodes relative to the bond head.

[c29] 29. The wire bonder of claim 24 wherein the first electrode comprises an anode and the second electrode comprises a cathode.

[c30] 30. A wire bonder for bonding a wire to a terminal of an electronic component, the wire bonder comprising:
a bond head having a capillary;
a first electrode and a second electrode disposed relative to the bond head; and
a controller operably coupled to the first and second electrodes, the controller having a computer-readable medium containing instructions to perform a method comprising –
positioning the first electrode and a second electrode at least proximate to the wire attached to the terminal of the electronic component; and
severing the wire with an electrical discharge between the first and second electrodes.

[c31] 31. The wire bonder of claim 30 wherein the first and second electrodes are attached to a dielectric member.

[c32] 32. The wire bonder of claim 30 wherein the first and second electrodes are attached to a dielectric member, and wherein the first electrode has a first arcuate portion with a first tip and the second electrode has a second arcuate portion with a second tip spaced apart from the first tip by a gap sized to receive the wire.

- [c33] 33. The wire bonder of claim 30 wherein the first and second electrodes and the bond head are movable as a unit.
- [c34] 34. The wire bonder of claim 30, further comprising a positioning mechanism coupled to the first and second electrodes to move the first and second electrodes relative to the bond head.
- [c35] 35. The wire bonder of claim 30 wherein the first electrode comprises an anode and the second electrode comprises a cathode.
- [c36] 36. A wire bonder for bonding a wire to a terminal of a microelectronic component, the wire bonder comprising:
a bond head having a capillary;
a first electrode and a second electrode disposed relative to the bond head; and
a controller operably coupled to the first and second electrodes, the controller having a computer-readable medium containing instructions to perform a method comprising –
attaching the wire to the terminal of the microelectronic component;
and
generating an arc between the first and second electrodes to sever the wire at a point at least proximate to the first and second electrodes.
- [c37] 37. The wire bonder of claim 36 wherein the first and second electrodes are attached to a dielectric member.
- [c38] 38. The wire bonder of claim 36 wherein the first and second electrodes are attached to a dielectric member, and wherein the first electrode has a first arcuate portion with a first tip and the second electrode has a second arcuate

portion with a second tip spaced apart from the first tip by a gap sized to receive the wire.

[c39] 39. The wire bonder of claim 36 wherein the first and second electrodes and the bond head are movable as a unit.

[c40] 40. The wire bonder of claim 36, further comprising a positioning mechanism coupled to the first and second electrodes to move the first and second electrodes relative to the bond head.

[c41] 41. A wire bonder for bonding a wire to a terminal of a microelectronic component, the wire bonder comprising:

 a bond head having a capillary; and

 a wire severing tool disposed relative to the bond head, the wire severing tool having a first electrode, a second electrode, and a dielectric member separating the first and second electrodes, the first electrode including a first end portion and the second electrode including a second end portion spaced apart from the first end portion to define an opening for receiving the wire.

[c42] 42. The wire bonder of claim 41 wherein the wire severing tool and the bond head are movable as a unit.

[c43] 43. The wire bonder of claim 41, further comprising a positioning mechanism coupled to the wire severing tool to move the wire severing tool relative to the bond head.

[c44] 44. The wire bonder of claim 41 wherein the first end portion includes a first tip and the second end portion includes a second tip spaced apart from the first tip by a gap sized to receive the wire.

[c45] 45. The wire bonder of claim 41 wherein the first and second end portions have arcuate configurations.